

Modern Concepts of Cardiovascular Disease

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FOREWORD

THE American Heart Association has decided to issue monthly abstracts and reviews on various practical aspects of cardiovascular disease. These pamphlets will be sent to as many physicians as possible, particularly to those practitioners who are not in intimate contact with large medical centers or teaching institutions. The purpose of this is to keep such men better informed concerning the recent developments in the diagnosis, prognosis, and treatment of cardiovascular disease. There will be two parts to these reviews. One will take up special topics of interest and the other will consist of brief abstracts of papers that are constantly appearing in current medical periodicals. It is intended that the discussions should be simple and useful and of such a type that they may be of help in ordinary general practice. The topics that will be taken up will vary from time to time so that all important phases of the problem of heart disease will be covered.

THE PROPER ADMINISTRATION OF DIGITALIS

Although there is much to the treatment of heart disease that does not concern itself with the use of drugs, the proper and intelligent administration of digitalis often decides whether or not the patient recovers and becomes ambulatory. Digitalis is a drug that cannot be given aimlessly, nor is it to be expected that the same results will be obtained under different conditions. There are times when it can be predicted that no particular good will come of its use, and other times when one would be surprised if a beneficial therapeutic response did not occur. The physician must at all times know in accurate terms the exact quantitative amount of digitalis that his patient is taking.

Let us first consider what kind of digitalis should be used. Whereas, fifteen or twenty years ago many preparations of digitalis in the open market were

very inactive, unreliable, and varied in strength, nowadays practically all the different kinds of digitalis in general use are reliable, active, and accurately standardized. Formerly some of the digitalis, even that used in large good hospitals, was absolutely inert; now the main difference in the various preparations is the price. There is no need for a patient paying more than two cents for a trustworthy pill of digitalis containing one and one-half grains. There is practically no advantage of one preparation of the drug over another. When the drug salesman insists that his drug does not produce nausea, because it is a fat free tincture, or because it is prepared in a certain way, or because of some other assumed advantage, it will generally be found that in appropriate doses the same results will ensue that follow the use of any other digi-

talis, if it is active. One may maintain that if a form of digitalis will not produce nausea, it is not reliable. There is, therefore, no practical advantage of a chloroform extract over an aqueous extract, a fat free tincture over an ordinary tincture, or one pill over another.

It is customary to use either a tincture of digitalis or powdered leaves of digitalis in pill or tablet form. The latter has many advantages that recommend it. When using a pill or tablet the doctor can always know the exact amount his patient is taking. If a tincture is used, unless it is being accurately and intelligently measured, he does not know the exact amount. Often a patient is told to take five drops, three times a day, assuming that a drop is a minim. It will always be found that there will be between two and four drops of tincture of digitalis to a minim. A study of this question some years ago showed that 30 to 60 drops were equivalent to 15 minims or 1 cc., in different hospitals with different nurses and droppers. The variations were found to depend on three factors, i. e., the type of medicine dropper, the angle at which it was held, and the speed with which the drops fell. From this it follows that drop dosage is not accurate. Tinctures can be used very effectively if the proper amounts are given. It is much simpler for the patient and more accurate to use digitalis in pill form, and a convenient strength is one containing one grain and a half of digitalis.

It must be remembered that the dose of digitalis is not the same in all patients. The greater the body weight, the greater the required dose, but there are other individual variations not dependent on weight. While discussing dosage, it is well to bear in mind that 1 cc. of tincture, fifteen minims of tincture, 0.1 gram of digitalis and $1\frac{1}{2}$ grains are all equivalents. In general an average adult who has not recently had digitalis will need about 30 grains, 2.0 grams, 20 cc. or 300 minims of tincture of digitalis, if given by mouth in the course of several days, in order to become digitalized. Some will need less and some more. Because of this variability the drug is given in divided doses until the desired effect is produced. Unless there is need for great haste, which is extremely rare, one pill of $1\frac{1}{2}$ grains or its equivalent can be given four times a day for four to six days and then followed by a maintenance dose of one pill a day. The body is destroying or excreting about $1\frac{1}{2}$ grains a day and therefore continuing that as a daily dose maintains the state obtained by the larger doses. It will be found at times that a smaller or a little larger dose will be desirable. If the patient has had digitalis just before treatment is started, the dosage necessary may be smaller. It is known that the drug taken by mouth has its effect in eight to twelve hours. Therefore, a physician will do well to ex-

amine his patient each morning during digitalization, for then he can detect the effects of the administration of the preceding day.

When should the dose of digitalis be diminished and what are the toxic manifestations? The dose should be diminished when the desired therapeutic results are obtained. These effects are a proper slowing of the heart rate, a diuresis, and an improvement in the dyspnea, cyanosis, oedema or other evidences of heart failure. The toxic effects are the development of nausea, vomiting, general feeling of sickness, and occasionally visual disturbances. There are also findings in the heart of toxic effects. If the heart were previously regular and there develop sudden pauses indicating heart block, although no harm is done, the dose must be diminished or omitted. If a previously regular heart develops extra systoles, especially if coupling of beats occurs, the drug should be omitted for a while. This coupling can best be detected by auscultation because the second beat of the couple is an extra systole and may not be palpable at the radial artery. There are certain rare conditions that are difficult to recognize at the bedside which indicate toxicity, but in the great majority of instances the above criteria will serve adequately in guiding digitalis dosage.

It must be remembered that although nausea and vomiting frequently result from too much digitalis, it often occurs in congestive heart failure, because of too little digitalis, especially when there is an engorged liver. Then the drug needs to be continued and if it is vomited, a satisfactory procedure is to give the tincture of digitalis by rectum. The rectal dose is about the same as the oral dose. Under such circumstances, 4 cc. of tincture can be given in 50 or 100 cc. of water by rectum once a day for a while, until mouth dosage can be tolerated.

It is most important to know when digitalis therapy is indicated. In general, heart failure of the congestive type is the primary indication for digitalis. It does not matter whether the blood pressure is very high or very low, whether there is aortic or mitral or no valvular disease. If there is congestive failure as evidenced by cardiac dyspnea, engorgement of the veins, pitting oedema and the like, digitalis should be given. If auricular fibrillation (absolute irregularity) is present, the heart rate should be slowed by digitalis; if the heart rhythm is regular, the slowing of the rate will be much less. Merely because the heart rate is rapid, as in pneumonia or other infections, is no reason for giving digitalis. Although there are occasionally other well defined conditions in which digitalis is of value, for the most part its use will be confined to the treatment of the congestive type of heart failure.

S. A. LEVINE, M.D.

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